

CLAIMS

What is claimed is:

1. An apparatus to communicate between a first circuit board and a second circuit board, the apparatus comprising:
 - a light transmitter attached to a first circuit board; and
 - a corresponding light receiver attached to a second circuit board, the corresponding light receiver positioned to receive data signals through the air transmitted by the light transmitter when the first and second circuit boards are coupled with a backplane.
2. The apparatus of Claim 1 wherein the light transmitter is a laser diode.
3. The apparatus of Claim 2 wherein the laser diode is a Vertical Cavity Surface Emitting Laser (VCSEL).
4. The apparatus of Claim 1 wherein the corresponding light receiver is tuned to the frequency of the light transmitter.
5. The apparatus of Claim 1 wherein the light transmitter is selected from the group consisting of a laser transmitter, a radio transmitter, a digital transmitter, an infrared transmitter, and an ultraviolet transmitter.
6. The apparatus of Claim 1, further comprising;
 - a first fiber optic cable is operatively coupled with the light transmitter on the first circuit board to relay data signals to the light transmitter; and

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(backplane
connect.)
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17. A method to communicate between a first circuit board and a second circuit board, the method comprising:

affixing a light transmitter to the first circuit board, the light transmitter to transmit a data signal at a particular frequency;

affixing a corresponding light receiver to the second circuit board;

tuning the corresponding light receiver to the particular frequency of the light transmitter;

coupling the first circuit board with a chassis;

coupling the second circuit board with the chassis, such that the second circuit board is positioned substantially parallel ^{to} the first circuit board; and

positioning the light transmitter and corresponding light receiver such that the corresponding light receiver receives a data signal through the air transmitted by the light transmitter.

18. The method of Claim 17, further comprising:

coupling a fiber optic cable with the light transmitter to relay a data signal to the light transmitter; and

coupling a fiber optic cable with the corresponding light receiver to relay a data signal received by the light receiver.

19. The method of Claim 17, further comprising:

selecting the light transmitter from a group consisting of a laser transmitter, an ultraviolet transmitter, a radio transmitter, an infrared transmitter, and a digital transmitter.

20. The method of Claim 17, further comprising:

38. The method of Claim 37, further comprising:

establishing at least one optical channel between the plurality of boards, the optical channel being defined by a light transmitter on one board transmitting a data signal through the air to a corresponding light receiver on another board.

39. The method of Claim 37, further comprising:

arranging the plurality of circuit boards into a first group and a second group, wherein a placement of circuit boards in the first group forms a pattern, and wherein a placement of circuit boards in the second group forms a mirror image of the pattern.

40. The method of Claim 37, further comprising:

designating a redundant circuit board to operate in a shadow mode until a change in transmission intensity is detected in an optical channel.

41. The method of Claim 40, further comprising:

detecting a change in transmission intensity in the optical channel that occurs when a circuit board is inserted or removed;

automatically rerouting a data signal from the faulted optical channel through the redundant circuit board; and

automatically managing an orderly shutdown of the faulted optical channel.

42. The method of Claim 37, further comprising:

transmitting a first frequency color from the first light transmitter; and
transmitting a second frequency color from the second light transmitter.